

PROCEEDINGS OF THE BRAIN STORMING SESSION FOR IDENTIFYING THRUST AREA FOR TRAINING NEEDS

Rapporteur:

1. **Mr. Somesh Kumar**, Research Associate (Extension Management), BAMETI
2. **Mr. Rajesh Pandey**, Research Associate (IT), BAMETI

A One Day workshop on the topic mentioned above was organised by Bihar Agricultural Management & Extension Training Institute, Patna on 3.04.08 at SCADA Business Centre, Patna. The representatives of Rajendra Agricultural University comprising of experts from Agriculture, Horticulture, Fisheries, Extension Education, Food Processing, Animal Husbandry, Indian Council of Agricultural Research, Department of Animal Husbandry, Govt. of Bihar, Department of Fisheries, Govt. of Bihar, Directorate of Sericulture, Department of Industries, Govt. of Bihar, Cooperative Milk Federation (COMFED), Patna and other Central Government Institution & NABARD attended this workshop.

Background of the Workshop:

Given the low average yields of most commodities, the huge gaps between the demonstrated and generally realized yields, the low farmers' income and widespread rural poverty on one hand, and the richness of the natural resources and the socio-political expediency to liberate the people of Bihar from the poverty and hunger trap on the other hand, the business as usual will not yield the desired results. A holistic system based approach is needed to simultaneously enhance productivity, profitability, equity and environmental sustainability through synergistically integrating crop, cash crop, horticulture,

livestock, fisheries, agro forestry, watershed-based soil and water management, social capital formation, agro-processing and marketing in an end-to-end mode. Under a decision support system, the problems and their solutions must be disaggregated as per the location specific resources, needs and aspirations, calling for synergy among research, technology, extension, farmer, community-based organizations, markets, and public policy.

Innauguration:

The Workshop was inaugurated by Mr. Rai Pramod Kumar, I.A.S., Additional Secretary to the Government and State Nodal Officer, ATMA Scheme. The inaugural session was presided by Mr. N. Sravan Kumar, I.A.S., Director, Animal Husbandry, Govt. of Bihar. Dr. R.K. Sohane, Director, BAMETI coordinated the workshop.

The Valedictory session was presided by Mr. N.S. Madhavan, I.A.S., Principal Secretary, Govt. of Bihar, Department of Agriculture.

Various presentations were made by the experts highlighting respective needs of different sectors.

Following this the group was formed under the heads of Agriculture, Horticulture, Fisheries/Sericulture, Animal Husbandry/Dairy and Gender Issues, Agribusiness and Mass Media & IT Communication. The workshop proceedings was based on addressing needs of Agricultural Extension Management, Agricultural Business Management, Mass Media and Communication, Information Technology in Agricultural Extension.

Following Issues have emerged after day long deliberation:

Agriculture Production System

Critical gap	Strategic issue	Strategies
1. Technological gaps in agricultural crops like rice, wheat, maize, pulses and oilseeds.	Overcoming technological gaps in agricultural crops like rice, wheat, maize, pulses and oilseeds.	<ul style="list-style-type: none"> i. Educating farmers on technological gaps through extension functionaries and mass media. ii. Organizing training Programme on technological gaps. iii. Organize demonstration on seed treatment, fertilizer and pest management iv. Demonstration on use of bio fertilizer and micronutrient v. Linkage of farmers with credit inputs and marketing vi. Farmers field days for replication of successful innovations. vii. Workshop on Agro-processing and Value –addition techniques
2. Concept of seed village scheme.	Decentralized production of seeds of preferred varieties under the concept of seed village	<ul style="list-style-type: none"> i. Identification of success stories where quality seed is produced and sold by farmers. ii. Identification and selection of villages and villagers for seed production. iii. Exposure visits of farmers to

	scheme.	<p>successful sites in adjoining districts.</p> <p>iv. Training of farmers on seed certification, production and regular follow-up.</p> <p>v. Procurement of foundation /certified seeds of preferred varieties from reliable sources.</p> <p>vi. Facilitating linkage with credit inputs supply and certification.</p> <p>vii. Forward linkage for procurement of quality seed material.</p>
3. Value addition and agro-processing.	Value addition and agro-processing in rice, maize, wheat and pulses.	<p>i. Identification of FIG and CIG.</p> <p>ii. Exposure Visit to agro-processing center particularly Rice Maize, Wheat and pulses produces.</p> <p>iii. Demonstration and training on agro-processing value addition.</p> <p>iv. Facilitate linkage with supply of processing machinery credit and marketing.</p> <p>v. Identification of FIGs and CIGs for quality seed production in specific areas.</p> <p>vi. Facilitating supply of quality foundation /certified system.</p>
4. Quality production inputs.	Ensuring production and	<p>i. Identification of FIGs and CIGs for quality seed production in</p>

	delivery of quality production inputs.	specific areas. ii. Facilitating supply of quality foundation /certified seed. iii. Linkage with registered input suppliers viz. Fertilizer, seed micro-nutrients etc.
5. Popularization of useful machinery.	Popularization of useful machinery for cost minimization, zero tillage etc.	i. Organizing awareness campaign on useful farm equipment. ii. Facilitate training and demonstration at farming site. iii. Identification of agro-services, contract with farmers, agriclinic dealing equipment. iv. Linkage with on going schemes for subsidized sale of farm machines and other agril-equipment.
6. Optimization of seedling and planting time.	Optimization of seedling and planting time in light of soil moisture.	i. Awareness campaign on zero tillage machineries. ii. Demonstration on farmers for zero tillage machine. iii. Training to farmers on tilling and tilth management in the light of moisture management. iv. Exposure visit to successful farming places where zero tillage machines have been used. v. Identification of agencies dealing with zero tillage machines. vi. Facilitating infrastructural

		facilities to district Agriculture Office to extensify popularize the scheme
7. Forward linkage with Govt. and private agencies.	Forward linkage with Govt. and private agencies for remunerative prices of farm produce.	<ul style="list-style-type: none"> i. Carry out diagnostic study about issue relating to market. ii. Dove tailing of ongoing scheme on post harvest technology and market availabilities. iii. Identify for market opportunities for each commodity.
8- Non availability of quality seed at village level	<p>Needful amendments in seed act to ensure quality seeds distribution to farmers</p> <p>Packing of seed in small packets</p> <p>Ensure Agri-input availability at village level</p>	

<p>9-Use of nutrients according to soil test</p>	<p>Awareness about soil health and effect of nutrients on crop yield</p>	<p>Awareness camps and demonstrations</p>
<p>10-Unawareness of plant protection measures</p>	<p>Training camps and demonstration regarding plant protection measures.</p>	<p>Awareness camps and demonstrations Use of print media & IT</p>
<p>11-Popularizing improved method of composting & vermi-composting Creating awareness about importance of bio-fertilizers & increased production of bio-fertilizers</p>	<p>-Training -Exposure visit - Demonstration</p>	<p>Awareness camps and demonstrations Use of print media & IT</p>

<p>12-. Diversification and intensification.</p>	<p>Diversification and intensification of medicinal and aromatic plants.</p>	<p>i. Identification of specific areas for medicinal and aromatic plant cultivation. ii. Training to FIGs' iii. Facilitating supply of key inputs, planting materials. iv. Exposure visit to successful sites and CIMAP, Lucknow. v. Linkage with inputs supply and marketing agencies. vi. Revolving funds for strengthen FIG/SHGs'</p>
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Animal Husbandry and Dairy:

Critical gap	Strategic issue	Strategies
<p>Breed upgradation.</p>	<p>Breed upgradation in dairy animals</p>	<p>1. Refresher training of paravets for providing AI at doorstep. 2. Develop literature on general animal health management in local language. 3. Revival of frozen semen bank. Semen to be procured from BAIF and COMFED. 4. Exposure visit of FIGs to NDDB, Siliguri. 5. Organization of camps for</p>

		infertility treatment. 6. Input supply on cost recovery basis
Artificial Insemination	<p>a) Improving knowledge about advantage & disadvantage of AI.</p> <p>b) Improving % of conception in AI</p> <p>c) Improve awareness of AI importance.</p>	<p>a) Providing awareness about AI with audio / visuals aids.</p> <p>b) Conducting fertility improvement camps</p> <p>c) Providing awareness programme through training & field visits.</p>
Animal Care	<p>Improving the knowledge about animal production capacity and its fodder requirement.</p> <p>Improving knowledge about importance of minerals & vitamins.</p>	<p>a) Providing awareness about animal production capacity, its requirements & dairy economics</p> <p>b) Intensify the awareness Programme about importance of feeding minerals & vitamins.</p>
Health & Hygiene	Improve knowledge about animal health & hygiene.	<p>a) Intensify the awareness the programme about animal health & hygiene through training & Field visits.</p> <p>b) Intensify the conduction of animal health camps.</p> <p>c) Intensify the conduction of mass dosing programme & external practice control programmes.</p> <p>d) Erecting disease diagnostic</p>

		lab. At block level
Feed & Fodder for milch animals	Improve awareness about feed & fodder requirement of animal	<p>a) Providing awareness programmes about the feed & fodder requirement of the animal.</p> <p>b) Intensify the supply of fodder seeds.</p>
Processing of Milk	Processing & preservation of milk products for value additions	<p>(i) Assessment of problems related to spoilage of surplus milk (Convergence allowance assessment)</p> <p>(ii) Exposure visit at Haryana/ Punjab/ NDDDB ,Anand</p> <p>(iii) Training on value addition of milk & milk products.</p> <p>(iv) Revolving funds (for manual cream separator, hand churn, khoa making utensils etc.)</p>
Use of Animal Waste	Vermi composting from farm by products	<p>(a) Awareness campaign</p> <p>(b) Demonstration cum training at Block Level.</p> <p>(c) Developing innovative farmers as entrepreneur for vermiculture inputs</p>
Commercial Goat	Health, Feed, and Forward	1. Awareness campaign.

Rearing	Linkage	<p>2. Training on improved goat rearing.</p> <p>3. Revolving fund for arranging improved breed/stock and other inputs to FIGs.</p> <p>4. Exposure visit to CIG, Mathura</p>
Livestock Bye product management (Hide, Bone, Meat, Blood, Offales)		<p>1. Awareness campaign.</p> <p>2. Training on improved methods of management</p>

Horticulture Crops:

Critical Gap	Strategic issue	Strategies
Intensification	Introduction and Intensification of Agri-Horti-Farming System, Apiary and Multi-tier Cropping	<p>i. Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and additional crop under shade.</p> <p>ii. Promotion of FIG</p> <p>iii. Community demonstration</p> <p>iv. Field day</p> <p>v. Backward and forward linkage</p>
Off Season	Expansion of area under off	i. Area expansion,

Vegetables	season vegetables	<p>campaign (group discussion) formed under macro mode planning</p> <p>ii. Promotion of FIG</p> <p>iii. Training to off-season vegetable groups in specific area for particular situations and follow-up.</p> <p>iv. Facilitating supply to critical inputs such as off-season vegetable seeds and other inputs.</p>
Rejuvenation of Old Orchards	Intensification of area under local fruit races particularly mango and Rejuvenation of Old Orchards	<p>i. Identification of specific beneficiaries for the particular mango cultivation and awareness.</p> <p>ii. Promotion of FIG</p> <p>iii. Training to interested mango growers at CISH-Lucknow</p> <p>iv. Organizing mango days at successful sites and felicitations to successful farmers.</p>
Technical Gap in Production of Fruit Crops	Overcoming technical gap in major fruit crops like mango guava, Banana and citrus	<p>i. Awareness campaign of technical know-how, package of practices and technological gaps.</p> <p>ii. Organizing location based training on</p>

		<p>technological gaps.</p> <p>iii. Demonstration on raising of planting material, after-care, IPM, INM, etc. and care and management of old orchards.</p> <p>iv. Exposure visit</p> <p>v. Establish linkage (credit, supply of inputs and marketing channels).</p>
<p>Technical Gap in Production of major vegetable crops.</p>	<p>Over coming technological gap in major vegetable crops.</p>	<p>i. Awareness campaign and proper education of farmers through mass media /extension functionaries on technological gaps.</p> <p>ii. Organizing special training on hybrid vegetable cultivation</p> <p>iii. Demonstration on INM, IPM and other package of practices.</p> <p>iv. Exposure visit to IIVR Varanasi</p>
<p>Technical Gap in Production of Aromatic Crops.</p>	<p>Over coming technological gap.</p>	<p>i. Awareness campaign and proper education of farmers through mass media /extension functionaries on</p>

		<p>technological gaps.</p> <p>ii. Organizing special training on Aromatic Plant cultivation</p> <p>iii. Demonstration on INM, IPM and other package of practices.</p> <p>iv. Exposure visit to Successful sites.</p>
Technical Gap in Production of Honey.	Over coming technological gap.	<p>i. Awareness campaign and proper education of farmers through mass media /extension functionaries on technological gaps.</p> <p>ii. Organizing special training on Honey bee and honey production and processing</p> <p>iii. Exposure visit to Successful sites.</p>
Technical Gap in Production of major Spices	Over coming technological gap in major Spices.	<p>i. Awareness campaign and proper education of farmers through mass media /extension functionaries on technological gaps.</p> <p>ii. Organizing special training on spices cultivation</p>

		<p>iii. Demonstration on INM, IPM and other package of practices.</p> <p>iv. Exposure visit to successful sites.</p>
Water Management	Popularizing Micro Irrigation and Government Schemes- (OFWAM)	<p>i. Awareness campaign and identification of successful sites where the sprinkler or drip irrigation system already in use.</p> <p>ii. Identification and follow-up with potential farmers and commercial banks.</p> <p>iii. Exposure visit to successful sites.</p> <p>iv. Linkage with credit and other input supplying agencies.</p> <p>v. Identification of agril services center dealing with micro irrigation machines</p>
HRD Arrangements	Stream-lining and Capacity Building of Para Horticulture /Malis developed by RAU Pusa	<p>i. Identification of Para Hort's / Mali's developed from RAU.</p> <p>ii. Linking of selected and identified para-horts /Malis with fruit and flower growers.</p>

		iii. Revolving funds for strengthening Selected and identified Para-horts /Malis to open commercial flower center.
Integrated Nutrient Management	Integrated nutrients management	-Demonstration -Exposure visit -Training
IPM & IDM	Integrated pest & diseases management	-Demonstration -Exposure visit -Training -Soil testing
Processing & Forward Linkage	Value addition techniques & marketing.	Demonstration -Exposure visit -Training
Organic Production	Popularizing production and use of improved method of bio-fertilizer and cakes and compositing & vermin- composting	-Training -Exposure visit -Demonstration

Fish Production System

Scientific Piscicultur e	Commercial fish production on scientific lines	i. Awareness campaign about Importance of Water quality, Shape & Size of Ponds, crafts & gears ii. Training on Fish Breeding & Its commercial aspect, Different kinds of culture concept iii. Distribution of printed materials to promote commercial fish production on
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		scientific line
Availability of Seedlings	Decentralized Production of Fingerlings	i. Awareness campaign ii. Training at various institution of repute iii. Distribution of printed materials to promote commercial fish production on scientific line
Modern Tools & Equipments	Entrepreneurship Development for Improved Fishnet Production	i. Awareness campaign ii. Training and Exposure visit at various institution of repute.
Feed & Health Care	Promotion of Fish Feed Production Unit	i. Identification of Fish feed production units within and outside the district. ii. Entrepreneurship development iii. Awareness campaign iv. Training and Exposure visit at various institution of repute. v. Backward and Forward linkages.
Storage & Marketing		i. Entrepreneurship development ii. Awareness campaign

DIVERSIFICATION & INTENSIFICATION

AGRICULTURE

Critical Gap	Strategic issue	Strategies
Imbalanced use of fertilizer	Integrated nutrients management	-Demonstration -Exposure visit -Training
Inadequate plant protection measures	Integrated pest & diseases management	-Demonstration -Exposure visit -Training

		-Soil testing
Intensification of existing crop	Popularizing high yielding varieties against local varieties	-Demonstration -Exposure visit -Training
Injudicious use of water	Scientific method of irrigation practices/drip irrigation	-Demonstration -Exposure visit -Training
<i>HORTICULTURE</i>		
Inefficient management of pest & diseases	Integrated pest/diseases management.	-Demonstration -Exposure visit -Training
Less coverage under floriculture	Lack of awareness. Lack of credit. Lack of technical knows how.	-Demonstration -Exposure visit -Training
Less coverage under fruit crops	Lack of awareness. Supply of quality planting material.	-Demonstration -Exposure visit -Training.
Marketing	Value addition techniques & marketing.	-Demonstration -Exposure visit
Off season cultivation of vegetables and fruits	Use of protected structure to grow crop	-Demonstration -Exposure visit -Training.
<i>ANIMAL HUSBANDRY</i>		
<i>Breeding</i>		
<i>A-Cows & Buffaloes</i> Local breed Non availability of proven siren	Inseminating animals with recommended breed semen Buffaloes:	-Providing JR semen -Providing bulk cryocans (semen containers) -Providing technical person for AI. -Providing training programme for farmers

Inbreeding	-Introduction of Murrah Breed	regarding breed upgradation -Providing Murrah bulls.
B. Sheep & goats Non-descript breed & inbreeding	Avoid inbreeding.	-Providing Bannur & UAS Rams. -Providing Deccani bucks. -Providing training programs about upgradation to farmers. -field visits.
Cows & Buffaloes, Sheep & Goats Non –availability of quality fodder Imbalance feeding habit	-To feed both cereals & legumes fodder -To feed balanced feed with minerals & vitamins	-Providing awareness about nutritional requirement of the animal & nutritional status of various fodder & feedstuffs by awareness programme and field visits. -Providing seedling seed of legumes plants & drought resistant varieties & fodder.
General Management		
Improper housing of animals	To construct proper housing with ventilation facilities for animals	-Training -Exposure visit -Demonstration

Sericulture

Technical Gap	<ul style="list-style-type: none"> • Plantation • Rearing of Silk worm • Post Cocoon Technology Reeling & Spining 	i. Identification of silk production units within and outside the district. ii. Entrepreneurship development iii. Awareness
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		campaign iv. Training and Exposure visit at various institution of repute.
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For Sustainability in Productivity / Income.

Agriculture

Critical Gap	Strategic issue	Strategies
Lack of awareness about commercialization	To create awareness and promotional strategies	-Training -Exposure visit -Demonstration
Inadequate & use of low quality organic manure.	Popularizing improved method of composting & vermin-composting	-Training -Exposure visit -Demonstration
Less use and inadequate availability of bio-fertilizers	Creating awareness about importance of bio-fertilizers & increased production of bio-fertilizers	-Training -Exposure visit -Demonstration -Increase production & use of bio-fertilizers
Depletion of soil fertility due to injudicious use of fertilizers	Application of fertilizers based on soil testing results.	-Demonstration -Exposure visits. -Soil testing facilities
Deficiency of micro-nutrients.	Application of Micro-nutrients on the basis of soil test results.	-Demonstration -Exposure visits.

		-Soil testing facilities
Inadequate management of agricultural produce	Institutional support for developing linkages with traders	-Exposure visit
Partial adoption of drip irrigation	Management of scarce water resources and popularizing drip irrigation	-Training -Exposure visit -Demonstration
Non-availability of elite or superior planting material	Introduction and development of superior planting type (s) Concept of high density plantation	-Training -Exposure visit -Demonstration
Lack of post harvest management practices like storage and processing	Creation of infrastructural facilities and value addition of produce	-Training -Exposure visit -Demonstration
Depletion of soil fertility	Popularizing of integrated nutrients management	-Training -Exposure visit -Demonstration
Inadequate pest & diseases control measures	Popularizing IPM	-Training -Exposure visit -Demonstration

Integrated Nutrients Management

Integrated Nutrients Management	<ol style="list-style-type: none"> 1. To organize awareness campaign for INM technologies 2. Identification and selection of feasible waste
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	<p>land where green manure seeds Bio fertilizer can be produced through SHGs/Mahila Mandal etc.</p> <p>3. Organizing training for cultivators on production on and use of bio fertilizer vermi fertilizers compost and balance use of chemical fertilizer on soil tests.</p> <p>4. Organizing field day at the site of successful Demonstration.</p>
Inclusion of organics in nutrients management	<p>1. Awareness campaign for use of organic in nutrient management</p> <p>2. Organize farming for farmers for production and inclusion of organics in nutrients management</p> <p>3. To organize field day on successful site.</p> <p>4. To organize plantation of leaf manure crops on waste land or an common lands.</p>
Promotion of green manuring through seed production	<p>1. Identification of areas and villages cultivation of for green manuring crops</p> <p>2. Multiplication of the green manure seed varieties through co-operation of the farmers</p> <p>3. Facilitate supply of critical inputs like and through seed supplying agency.</p> <p>4. Organizing demonstration and field days.</p> <p>5. Exposure visit to successful site.</p> <p>6. Farmers training on improved green manure crop cultivation.</p>
Micro nutrients managements for optimum field &	<p>1. Awareness campaign about micro-nutrients management</p> <p>2. Identify the specific areas where the soil</p>

soil health along with organics	<p>deficiencies in micro-nutrients such as zinc in particular</p> <ol style="list-style-type: none"> 3. Training to progressive farmers for proper management of micronutrients. 4. Demonstration on specific crops like paddy in which zinc deficiency often occurs. 5. Conduct field days at the site of successful demonstration.
Checking obnoxious weeds like Phalaris minor and Parthinium	<ol style="list-style-type: none"> 1. To identify the areas first where these obnoxious weeds are visible 2. To educate the farmers for judicious use of weedicides 3. Organizing training for better knowledge of pre and post emergence of weeds. To cultivators including mechanical eradication.
Intensification of zero tillage to reduce exposure oxidation of soil organic matter	<ol style="list-style-type: none"> 1. Awareness campaign about benefits of zero-tillage machine 2. Demonstration successful site of zero tilling and production of crops 3. Field day on the farm & other successful cultivators. 4. Exposure visit to Agril Engineering department/ Zero tillage machine supplier
Promotion of soil test based intensive cultivation for balanced nutrition	<ol style="list-style-type: none"> 1. Awareness campaign for benefit of soil testing 2. Arrangement for collection of soil sample through the line Deptt. 3. Facilitate with a soil testing kit to 10 blocks of the district. 4. Arrangement for making available the soil

	testing support as early as possible on receipt of money from the cultivators.
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Integrated Pest management

Integrated Pest management	<ol style="list-style-type: none"> 1. Organize awareness campaign on IPM technology. 2. Identification of critical areas where pest infestation always occur 3. Organizing demonstration on crop pest management 4. Organizing farmer's field day to make the farmers IPM experts. 5. Organizing training to farmers. 6. Facilitate supply of bio pesticides in set net pheromone traps etc. on subsidized payment.
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Seed Multiplication & Replacement

Decentralized Production of Seed & Planting Material of Major Vegetables.	<ol style="list-style-type: none"> i. Awareness campaign ii. Identification and promotion of FIGs' for decentralized vegetable seed production iii. Exposure visit of FIGs' to successful sites in other district/state. iv Training for seed production and certification. v. Arrangement of foundation /certified seed of location specific varieties from reliable sources on payment for the interested FIGs'.
Intensification of True Potato Seed Production (TPS).	<ol style="list-style-type: none"> i. Awareness campaign and identification of areas where farmers are ready to grow TPS. ii. Training to interested growers at CPRI, Patna particularly for nursery preparations

	<ul style="list-style-type: none"> iii. Exposure visit to success sites iv. Demonstration on farmers site v. Linkage with research and extension institutions.
Promotion of FIGs for Planting Material of Horticulture Plants and Commercial Floriculture	<ul style="list-style-type: none"> i. Awareness and Identification of FIGs in specific areas to promote them for commercial cultivations of floriculture. ii. Special training to FIGs' for production of planting materials. iii. Facilitate supply of critical inputs such as planting material. iv. Exposure visits to BTT members on – Group Dynamics, IPNM, Water Budgeting, Vermi-composting, Fodder crops and Plant Tissue culture. v. Exposure visit to successful sites for FIGs'.

Horticultural Planting Material

Critical gap	Strategies	Activities
<i>Scanty and erratic rainfall</i>		
Unscrupulous destruction of natural vegetation	Afforestation of suitable trees	Vanmahotsav, Awareness campain Mass media
Shrinkage of fauna or wildlife	Natural santuraries and National park	Mass media
Less percolation of water and high surface runoff	Afforestation and expansion of orchards Constrauction of trenches for enhancing infiltration rate	Mass media Awareness camp

Reduction in local storage structures	Creation of local structure based on indigeneous knowledge	Awareness camp Mass Media
<i>Soil Health</i>		
Decreasing soil fertility and organic matter.	Integrated Nutrient Management	Trainings Demonstrations
Non-judicious use of fertilizers and chemicals.	Use of fertilizers and chemicals on soil test and need basis.	Trainings Demonstrations
Poor management of local farm yard manures and residues resulting in high incidence of white grubs	Digging of pits and proper management of FYM and crop residue.	Trainings Demonstrations Exposure visit
Increasing soil alclinity.	Use of vermicompost and use of improved methods of composting EM activities pit , use of Trichodera, Bacillus for fast decomposition.	Trainings Demonstrations Exposure visit

Natural Resource management for Sustainability of Production and Productivity

Natural Resource management for Sustainability of Production and Productivity	<ol style="list-style-type: none"> 1. Mangement of soil health through cultural practices and suitable crop rotations. 2. INM an IPM 3. Inclusion of organics in nutrient management. 4. Promotion of green Manuring
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	<p>through seed production.</p> <p>5. Micro nutrient management for optimum yield and soil health along with organics.</p> <p>6. Checking obnoxious weeds like Phalaris minor and Parthenium.</p> <p>7. Managing existing and potential water areas for pisciculture</p>
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Farm Mechanization

- Continuous assessment of farm/farmers needs as per changing farm / market situation.
- Educating farmers on use and handling of different farm machinery and implements.
- Feed back on working and handling of old and new farm machinery for alteration / modification for increased efficiency / adoptability at local level.
- Conducting demonstrations, field days and other extension activities for popularizing specific farm machinery / implements at local level for increased farm efficiency and profitability.
- Specific demonstrations / field trials on power tiller, drill, Bed planter, Potato ridger, hand hoe, Mould board plough and other related machinery / implements for timely operations resource conservation.
- Popularization of modern storage, post harvest handling and value addition, machinery and technology for enhancing farm income and employment generation as per market needs.

Marketing Needs

- Establishment of e-marketing facilities with modern networking.
- Establishing backward and forward linkages of the farmers with input dealers, service providers and processors.
- Establishing chain of godowns, cold storage and other related infrastructures with barrier free movement of agri-produce.
- Farmers' exposure visits.
- Conducting proper training regarding safe packing and value addition and storage.
- Encourage Agri-clinic & Agri-business centers to provide single window service in respect to input supply, technical know-how & market information.
- Linkage between rural produces and urban consumers through positive approach.
- To trained the farmers through Training and demonstration by involving experts regarding value addition to their product.
- Conducting market surveys and market intelligence services to farmers.
- Encourage buy back arrangement/contract farming for farm produce with processors.
- Establishment of SHGs to provide market facilities locally for farm produce.
- Encouraging local farmers' organizations to serve as link organization with external reputed market organization.

Media Sensitization

- Providing information to farmers on market avenues, market trend, prevailing market prices and other relevant information periodically through TV, Radio, Kisan call centers & News paper.

- Under the Support to State for Extension Reforms Programme all the Block level Farm Information and Advisory Centres in the district would be electronically linked to district, state and national institutions. Central Govt. would support states in the use of electronic linkages and computerization so that marketing, research, extension and farming communities are linked to each other, and into local, national and global networks. The objective is to link all blocks of the district with national and international networks in a phased manner.
- This would include ATMA newsletter, success stories in film and electronic form, technical messages in electronic form and on electronic media, electronic access to all stake holder, through NICNET, and video conferencing facilities being established at DM's Conference Hall, electronic mail access to ICAR institutes and researches from Rajendra Agricultural University, Bihar along with state and national administrative offices, and electronic access to ARIS system databases and, eventually, to the World Wide Web.

Human Resource Development

1.	Increasing techno-managerial capacity of farming community on Farming System approach.
2.	Acquaintance to gap in technical, managerial and organizational aspects.
3.	Training on importance of follow-up action and feedback.
4.	Organizing training to extension personnel on participatory research, extension techniques, behavioral science and inter personal skills etc.
5.	Training to extension personnel in training needs assessment (TNA).

6.	Regular interface between GB, FAC, NGOs' with BTT FIGs, CIGs' and Research Scientists.
7.	Training on IT and Cyber extension.
8.	Skill upgradation training for grass root level workers.
9.	Specialized training course for NGOs', farmers, farmwomen and Para-technicians.
10.	Exposure visits of public and private extension workers including FIGs'.
11.	Organizing need based training programme for extension functionaries of line departments, NGOs', service providers and Para-technicians.

Agribusiness

<ul style="list-style-type: none"> • Seed Production • Technological Intervention for Increase in Productivity • Water use Efficiency • Agribusiness and agri Industries • Marketing and Export • Management Development Programme 	<ul style="list-style-type: none"> • Sensitization for Ab & Ai • Potential Areas for Ab & Ai • Project Proposal Formulation • Financial Aspects for proposed projects • Backward Linkages • Forward Linkages • Product Development • Supply Chain Management • Global Trend in Ab& Ai • Diversification in Ab & Ai • Innovation & Creativeness in Ab & Ai (Ab – Agribusiness; Ai –Agri Industries)
<p>Marketing & Export</p>	<ul style="list-style-type: none"> • Basic concept of marketing & Export • Commodity/Product wise Marketing strategies • Market Intelligent • Global & Domestic Food market Trends • E-Marketing

<p>Management Development Programme</p>	<ul style="list-style-type: none"> • Personality Development • Organizational Efficiency & effectiveness • Organizational Change • Team Building • Leadership • Communication skills • ICT in Ab & Ai • Women empowerment in Ab & Ai • Motivation • Agribusiness Environment • Conflict Management • Ab & Ai Laws, By Laws Rules, Systems & Precedence
<p>Market Orientation and sensitization of changing scenario of commodity trade</p>	<ul style="list-style-type: none"> • Market Development • Value Chain Management • Value addition and processing • Brand Management • Agri Entrepreneurs development • Disaster Management in Ab & Ai • Risk Management Strategies • WTO and its Impact • IPR and GI • Legal aspects of Ab & Ai • New Initiatives in Ab & Ai • Simulation Exercise • Exposure Visit Domestic & Abroad • Technologist-Entrepreneurs meeting • Producers – Marketers interface • Business events, Film Show, Meet Exchange programme

Mass Media & Communication

<p>Use of mass media for strengthening the Agricultural Extension</p>	<ol style="list-style-type: none"> 1. Tenets of communication and its application for agricultural extension management 2. Planning and developing scripts for Radio and Television programs 3. Rationale, Concept, Operationalization and Success Stories of Community Radio Stations (CSR) 4. Presentation skills for Radio
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	<p>and Television programs</p> <p>5. Evaluation of Radio and Television programs</p> <p>6. Mainstreaming Gender in Agriculture</p>
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Information Technology in Agricultural Extension

Computer Application	Computer Fundamental, MS-Office (MS-Word, MS- Excel, MS- Power Point)
Web Page Designing and MIS	Introduction to Web page, Hypertext Markup Language, Front page, Website Hosting. Level Of Information, Terms of DSS, TPS and MIS:- Management, Information and System
Cyber Extension & Use of ICT in Agriculture	Ways to retrieve relevant information; Interpretation price data for understanding market dynamics, Price trend analysis and forecasting; Preparation of reports; Ways to prepare commodity specific profiles;
Computerized Accounting	Manually Accounting & Bookkeeping, Financial Accounting through Tally

Other relevant thrust areas for attention

1. Risk Management-for biotic & abiotic stress
2. Integrated disaster management for flood and drought
3. Multiple use of water
4. Group Formation and further consolidation into Federations.

Key Recommendations:-

(i) Bridging the Existing Yield Gaps

Gap between the state average productivity and potential is very high owing to technology adoption and inputs. Therefore, bridging the existing yield gaps by making adequate availability of quality seeds and other inputs to farmers would be the first and foremost requirement for improvement of crop productivity. Crop specific and zone specific strategies should be adopted at farmer level to derive maximum benefit. There should be a specific programme to multiply the best quality breeder seeds and distribute them to farmers. Seed Corporation should be revamped and other agency on the pattern of Tarai seed, 'Pusa Beej' should be started. This will not only help the availability of seeds to the farmers but, seed sector could one of the enterprises. Seed village concept should also be encouraged by providing breeder seed and technological inputs. Successful experiments have been conducted in Bihar under Zero Tillage, Bed Planting, System of Rice Intensification (SRI) and Site Specific Nutrient Management Systems. Besides, efforts should be made to promote contract farming in maize, and certain horticultural crops for which the State has huge potential. Dairy Cooperatives being a success in Bihar need further support to enhance the health and productivity of livestock. They should be further expanded and also strengthened in case of fisheries and poultry sectors.

(ii) Efficient Use of Modern Inputs and Balanced Use of Fertilizer

An efficient and optimum use of modern inputs like quality seeds, chemical fertilizers and other macro and micro nutrients, is the key to productivity improvement on sustainable basis. Therefore, farmers should be enabled to access and use modern farm inputs in an optimal and efficient manner. Large scale demonstration, use of nutrient and water based soil and tissue test should receive major emphasis. There are soil testing technology but do not have capacity to function. Revamping the laboratory for efficient delivery system is essential. Efforts should be made to promote organic production technology including use of bio-fertilizers & bio-pesticides.

(iii) Development and Maintenance of Rural Infrastructure

Rural infrastructure should be strengthened to reduce the sharp swings in agricultural output. Aim should be to target the key constraints like poor water management, rural power supply, easy credit availability, and market access. Steps should also be taken to encourage renewable sources of energy. The State has highest potential for small hydropower projects, wind energy, bagasse based co-generation power from the existing and proposed sugar factories, Jatropha on waste lands, and rice husk based biomass gasification, biogas and solar energy.

(iv) Flood Control, Drainage, Water Management and Mitigating Drought

Lack of efficient on-farm water management is considered as one of the major constraints for low productivity and poor economic status of the farmers of Bihar. About forty one percent of the total cropped area in the state is flood prone and there is not much scope

for improvement in yield due to water logging, poor drainage and water management. In such areas, it would be absolutely essential for the state to make large scale investment in drainage and also utilize for fisheries. Flood control will also need attention for desilting of rivers, and strengthening of embankment. As far as the drought prone areas are concerned, there is need for water conservation and improving water use efficiency through rainwater harvesting, education of farmers and use of modern method of irrigation. Rainwater harvesting should be major strategy to meet irrigation needs of the crops. However, the State has abundant groundwater resource which could optimize the potentiality. Shallow tube wells are the quickest means of tapping the groundwater.

(v) Human Capital Formation and Strengthening of Agricultural Extension Services

Twenty first century agriculture is knowledge and technology based and human capital development is a must. Approach to knowledge and technology adoption by the farmers is again directly related to the level of his education. Dilapidated condition of human development institutions and a weak institutional structure is a road block in the overall development of Bihar. Education and health should therefore be given the first priority. Along with education and health, strengthening of agricultural research & development, appropriate to Bihar's topology and crop profile should also be an integral part of agriculture development strategy. There should be proper coordination among different agriculture extension institutions like Krishi Vigyan Kendra, Agriculture Technology Management Agency (ATMA), Rajendra Agriculture University Kisan Call Centre, State government, financial institution and farmers. Efforts should also be

made to arrange some training programmes for farmers at panchayat and block level. This would definitely help them in adopting modern technology more easily.

(vi) Effective R & D Support

Efficient R & D is building block for responsive agriculture. It has been estimated that investment on agricultural education and research has been most productive. The state has, one Agricultural University with 5 major campus and has done excellently well in last few years in terms of human resource development and research output. However, the University has not got the focus it deserves. Headquarter of University, Pusa, is a heritage for agriculture research and education. Therefore, this University should get the status of National University, which should not only meet the needs of the state but should contribute to national agriculture. The University will need support for modernization of infrastructure as well as scientist.

(vii) Market Oriented Agriculture

The state of Bihar produces large quantities of fruits, vegetables, and also livestock products. But do not have appropriate infrastructure for value addition and marketing. The state should develop commodity specific agro-export zones and give necessary support to their marketization. As a matter of fact, with proper development of markets, cooling arrangements in storage and transportation, processing and maintenance of quality, through grading, standardization, packaging, etc., products like litchi, mango, makhana and banana and a few vegetables can be exported to other states and even beyond the country, which will help improve farmer's

income. In order to provide a level playing field for private participation in marketing infrastructure and policy support be provided. Bihar is the first state, which has taken bold step for the reform of marketing by repealing the APMC Act, which was not conducive in modern competitive agriculture. However, there is a need for developing alternative model. The proposal of the Committee headed by Shri R.C.A. Jain be accepted to upgrade the marketing of produce. A suitable model of contract farming specific to crop can be adopted to solve the problems of small and marginal farmers.

(viii) **Strategic Agricultural Diversification**

Traditional crop farming alone cannot provide adequate employment and income to growing rural population in the state. Already the pressure of population on land is quite high. Therefore, the state should develop location specific plans for accelerated and diversified growth based on the strength. Diversification could be for crop varieties as well as other produce. More area could be brought under pulses, oilseeds, maize and diversification to horticulture, livestock and fisheries should find greater role. Horticultural diversification should cover fruits, vegetable, mushroom, flower, medicinal and aromatic plants. There is scope for coconut, oil palm and cashew in the state. This would involve not only proper planning activities, but also the creation of necessary infrastructure, institution and policy support. Fisheries and poultry the two most important areas having a high potential, need special attention. Districts with high productivity of gram and oilseeds call for urgent action to increase the area under these crops. Government can provide support either directly or indirectly through incentives to the private sector for supply

of seed/planting material, marketing, processing, etc. This is one area which is most suitable for contract farming. The contract farming is now a well accepted institutional arrangement to realize economies of scale, promote technology adoption and supply of needed quality inputs. The establishment of a Horticulture College at Nalanda in this respect is a welcome decision.

(ix) **Bihar as a Granary for India**

If proper thrust is placed on technologies, institutional direction, farm level support services, and all delivery mechanisms, following improved farm infrastructure including rural connectivity, Bihar can definitely emerge as the granary for India. It can also provide the major hubs on fruits, vegetables, and fisheries for both national and global markets. The entire economic growth processes in Bihar depend on the dynamics of agriculture.

There are successful experiments in the different parts of the country, which if adopted can provide an answer to various problems which Bihar is facing in its race to higher productivity levels. It would be better to avail of the readily available experience with a view to adapt that in keeping with the ground situation in Bihar. If above points are address, there is no reason for Bihar not to be able to condense the 30 years of development activity of Punjab to 10 years. It can then surely catch up with the present productivity levels of rice and wheat in Punjab and other cherished goals in maize, pulses, oilseeds, horticulture and livestock production in the next two five year Plans. Fortunately for Bihar, the State has trained agricultural labour from Punjab. The Bihari labour which was responsible for the first Green Revolution of Punjab will now provide the momentum for the

Second Green Revolution in their home State. Thus there is need for awakening with commitment to convert the weaknesses into opportunities and revamp agriculture which is a sole source of economic development.